

C. HAMBUECHEN.

DRY CELL AND PROCESS OF ASSEMBLING THE SAME.

APPLICATION FILED MAR. 29, 1922.

1,438,110.

Patented Dec. 5, 1922

Fig. 1.

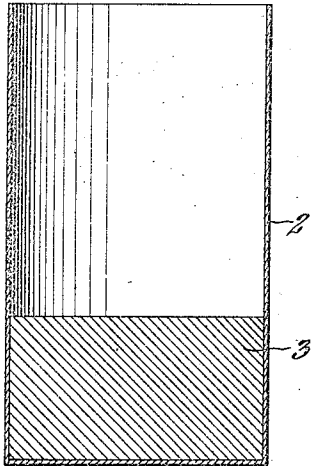


Fig. 2.

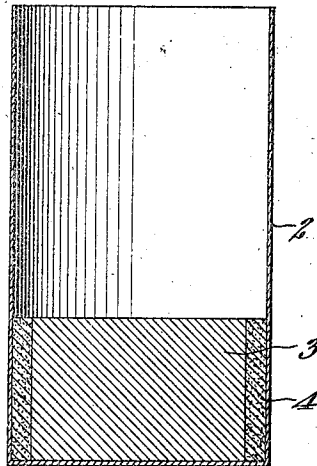


Fig. 3.

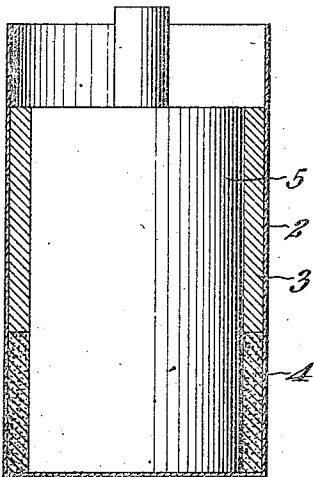
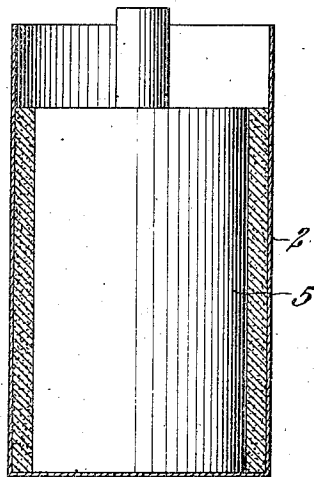


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DRY CELL AND PROCESS OF ASSEMBLING THE SAME.

Application filed March 29, 1922. Serial No. 547,800.

To all whom it may concern:

Be it known that I, CARL HAMBUECHEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Dry Cells and Processes of Assembling the Same, of which the following is a specification.

This invention relates to dry cells and has particular reference to improvements in the formation of a protective layer adherent to the inner surface of zinc container electrodes, and to the assembly of depolarizing bobbins and electrolyte paste with electrodes thus protected.

The method as above broadly outlined is disclosed in United States Patents 1,295,475, dated Feb. 25, 1919, and 1,375,202, dated April 19, 1921, both granted to H. F. French and R. C. Benner. According to these patents a film or layer of paste is applied to substantially the entire inner surface of zinc cups and is gelatinized thereon by suitable application of heat. In this manner the electrode is provided with a tough, tenacious coating. The procedure described makes it possible to use bobbins without the sustaining fabric wrapping which is ordinarily required to prevent detached particles of depolarizer from reaching the zinc and there forming centers for destructive local action. The elimination of the wrapping results in an improvement in the service characteristics of the cell and in a large decrease in the cost of production.

According to my invention, the above procedure has been modified in certain advantageous respects. Among the distinguishing features of the present process are the provision of an initial cooked paste layer on the lower part only of the container electrode, and the distribution of paste within the cell by displacement upon the insertion of the bobbin. The invention will be described in detail in connection with the accompanying drawings, illustrative of the several steps in the preparation of cells having no fabric or paper spacing the bobbin from the zinc, and commonly known as non-lining cells. In these drawings,

Fig. 1 is a vertical central section through a zinc cup containing paste.

Fig. 2 is a similar view, showing a paste layer adherent to the cup,

Fig. 3 is a vertical section through the cell after the bobbin has been introduced, and

Fig. 4 is a view similar to Fig. 3, showing the cell after the final heating operation.

In the improved method, a metal cup, denoted by reference numeral 2, is charged with gelatinizable material 3 to about one-third of its capacity. That portion of the material contiguous to the cup is then gelatinized to form a protective layer 4. The material 3 will ordinarily be a cereal paste containing electrolyte salts, and in such case may be rapidly gelatinized by immersing the cup in hot water. An immersion of 20 to 40 seconds duration in water at a temperature of about 70° C. forms a tough layer of cooked paste adherent to the metal.

A mix bobbin 5, preferably without a wrapping, is now inserted in the cup 2. The bobbin may rest upon a gelatinized layer at the base of the cup, or upon an insulating disk. The insertion of the bobbin causes displacement of the ungelatinized central body of paste upwardly to fill the annular space between the bobbin and the upper portion of the cup. The bottom of the bobbin is centered in the cup by the circumferential gelatinized layer 4. The quantity of paste may be so adjusted as to fill the cup to the top of the bobbin, or, if necessary, the paste level may be adjusted to secure this result. The cup is then heated to gelatinize the paste about the upper part of the bobbin. This heating may continue for about two minutes. It will be understood that the method and duration of heating referred to above may be varied to suit particular conditions. The upper part of the bobbin may be centered manually or by suitable mechanical means, and the cell may be provided with a seal and otherwise completed in the usual manner.

An essential feature of my invention, independent of any particular method, is the formation of a spacing and protective coating upon the lower interior surface of a metal container electrode, and any suitable procedure may be adopted for forming such a coating. I have found that it is unnecessary initially to gelatinize a layer of paste upon the entire interior surface of the electrode, as proposed in the patents mentioned herein, and the present procedure is simplified by the omission of the steps of pouring out the ungelatinized paste and

again introducing it after the insertion of the bobbin. Also, it is unnecessary to provide means for preventing adherence of paste to that portion of the cup with which the sealing material should make contact. The present procedure is well adapted to be carried out by machines, an important advantage in large-scale manufacture. These and various other distinctive features and advantages of the present invention will be apparent from the foregoing description, and are included within the scope of the claims appended hereto.

I claim:

15 1. Process of preparing hollow electrodes for dry cells, comprising applying a protective coating to a portion only of the interior surface of such electrodes.

20 2. Process of preparing hollow electrodes for dry cells, comprising gelatinizing a layer of paste upon a portion only of the interior surface of such electrodes.

25 3. Process of preparing container electrodes for dry cells of the non-lining type, comprising gelatinizing a layer of paste upon approximately the lower third of the inner surface of such electrodes.

30 4. Process of preparing dry cells of the non-lining type, comprising placing gelatinizable material in the lower portion of a metal container, gelatinizing the circumferential portion of the material and insert-

ing a mix bobbin into the container, whereby the ungelatinized material is displaced upwardly between the container and the bobbin.

5. Process of preparing dry cells of the non-lining type, comprising placing new electrolyte paste in the lower portion of a zinc container electrode, immersing the container in hot water to gelatinize the paste contiguous to the container, and inserting a mix bobbin into the container, whereby the ungelatinized paste is displaced upwardly between the container and the bobbin.

6. Process of preparing dry cells of the non-lining type, comprising placing raw electrolyte paste in the lower portion of a zinc container electrode, immersing the container in hot water to gelatinize the paste contiguous to the container, and gelatinizing the displaced paste.

7. A container electrode comprising a protective coating upon a portion only of its interior surface.

8. A container electrode comprising a layer of gelatinized paste upon a portion only of its interior surface, said layer being adapted to center a mix bobbin in the container.

In testimony whereof, I affix my signature.

CARL HAMBUECHEN.